

RAYMARIL  
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11615

APPENDIX A  
ANALYTICAL CHEMISTRY RESULTS

**APPENDIX A-1**  
**RESULTS OF SEDIMENT CHEMICAL ANALYSES: ORGANICS,**  
**INORGANICS, SEM/AVS, TOC, GRAIN SIZE**

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-SED-SMP	C-2-SED-SMP	C-3-SED-SMP	D-1-SED-SMP	D-2-SED-SMP	D-3-SED-SMP	D-4-SED-SMP	D-5-SED-SMP	D-6-SED-SMP
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
%TOC	1.30	3.10	4.10	1.70	3.40	2.00	3.40	1.40	1.50
Metals (mg/kg)									
Arsenic	2.40	9.40	9.10	3.30	6.50	2.90	5.90	1.60	3.80
Cadmium	0.22	0.31	0.42	0.16 J	0.32	2.10	0.63	0.34	0.60
Chromium	25.50	77.20	48.30	14.30	25.80	36.10	172	9.70	51.80
Copper	105	284	504	22.80	73.50	210	155	55.60	266
Lead	37.50	78.60	134	7.30	29.10	87.60	56.30	37.70	41.90
Mercury	0.21	0.59	0.80	0.04	0.89	0.06	0.26	0.12	0.46
Nickel	6.80	17.80	20.20	9.30	18.10	20.70	22.00	5.50	11.20
Silver	0.22	0.57	0.47	0.04 U	0.16 J	0.85	0.41	0.52	0.28
Zinc	68.40	189	243	41.50	118	178	158	56.70	162
Polyaromatic Hydrocarbons (PAHs) (µg/kg)									
1,8,7-Trimethylnaphthalene	3.00	8.00	5.00	1.00 U	1.50 U	88.00	6.00	14.00	15.00
1-Methylnaphthalene	4.00	10.00	6.00	1.00 U	1.50 U	77.00	12.00	13.00	8.00
1-Methylphenanthrene	20.00	58.00	22.00	1.00 U	14.00	410	56.00	40.00	16.00
2,6-Dimethylnaphthalene	4.00	12.00	7.00	1.00 U	1.50 U	95.00	11.00	11.00	13.00
2-Methylnaphthalene	9.00	18.00	14.00	1.00 U	4.00	140	20.00	20.00	16.00
Acenaphthene	4.00	22.00	5.00	1.00 U	3.00	360	76.00	12.00	9.00
Acenaphthylene	23.00	74.00	30.00	1.00 U	18.00	530	45.00	120	48.00
Anthracene	35.00	120	62.00	3.00	39.00	2200	200	190	87.00
Benzo(a)anthracene	130	390	220	9.00	130	5800	490	660	310
Benzo(a)pyrene	120	380	190	7.00	99.00	4400	480	570	300
Benzo(b)fluoranthene	110	510	180	8.00	93.00	6200	650	730	350
Benzo(e)pyrene	98.00	310	160	7.00	74.00	3200	360	380	200
Benzo(g,h,i)perylene	91.00	290	140	6.00	65.00	3000	330	330	180
Benzo(k)fluoranthene	110	120	150	8.00	77.00	1300	180	210	140
Biphenyl	3.00	6.00	6.00	1.00 U	1.50 U	210	6.00	13.00	5.00
Chrysene	120	380	180	8.00	110	4600	470	580	270
Dibenz(a,h)anthracene	18.00	58.00	28.00	1.00 U	14.00	680	74.00	100.00	44.00
Fluoranthene	190	650	310	17.00	200	12000	910	1100	400
Fluorene	5.00	30.00	10.00	1.00 U	4.00	480	54.00	18.00	8.00
Sum PAHs (6 High Molecular Weight) <sup>1</sup>	839	1910	991	56.00	973	28490	2534	3130	1411
Indeno(1,2,3-cd)pyrene	97.00	290	150	8.00	71.00	3700	380	400	210
Sum PAHs (7 Low Molecular Weight) <sup>2</sup>	184	58.00	279	22.00	181	14920	1198	576	340
Naphthalene	12.00	280	27.00	3.00	10.00	210	33.00	26.00	22.00
Phenanthrene	96.00 B	59.00 B	130 B	12.00 B	83.00 B	11000 B	770 B	200 B	150 B
Pyrene	200	59.00	370	18.00	180	12000	910	1100	490
Sum PAHs	1563	50.00	2446	134	1714	73690	6613	6947	3378

DQ = Data Qualifier: "U"=Undetected; "J"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077,104, and 154.

4 - Dioxin = 2,3,7,8 TCDD Equivalent; see Appendix D-3.

5 - Reference Station - GM08 (SAIC, 1998). Total PCBs = 18 Congeners x 2.

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	DQ-SED-FD		E-SED-SMP		F-SED-SMP		E-SED-SMP		E-SED-SMP		F-1-SED-SMP		F-2-SED-SMP		F-3-SED-SMP		Reference <sup>1</sup>	
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
%TOC	2.80		9.30		28.30		7.00		22.00		4.10		14.30		13.90		5.86	
Metals (mg/kg)																		
Arsenic	8.90		13.80		7.70		8.50		8.30		2.80		9.40		4.30		17.90	
Cadmium	2.80		0.04 U		0.03 U		0.12 J		0.05 U		0.80		0.16 J		0.04 U		1.50 B	
Chromium	270		139		53.00		20.80		47.70		36.40		390		47.70		231	
Copper	1560		278		130		36.60		99.40		106		781		174		661	
Lead	165		290		173		89.80		153		189		571		313		158	
Mercury	2.50		0.88		0.27		0.15		0.31		0.19		0.55		0.39		1.20	
Nickel	34.20		26.40		17.10		17.50		19.80		11.50		65.90		23.80		37.40 E	
Silver	1.10		4.50		2.00		0.24		1.10		0.30		1.10		0.50		3.00	
Zinc	780		191		85.50		115		86.60		191		982		378		292	
Polyaromatic Hydrocarbons (PAHs) (μg/g)																		
1,5,7-Trimethylnaphthalene	54.00		17.00		10.00 U		27.00		7.50 U		23.00		28.00		100.00			
1-Methylnaphthalene	21.00		32.00		34.00		24.00		17.00		21.00		54.00		220			
1-Methylphenanthrene	69.00		87.00		130		250		83.00		240		280		350			
2,6-Dimethylnaphthalene	42.00		23.00		10.00 U		23.00		7.50 U		33.00		78.00		170			
2-Methylnaphthalene	58.00		50.00		48.00		38.00		25.00		40.00		99.00		130		330 U	
Acenaphthene	32.00		21.00		10.00 U		79.00		7.50 U		35.00		59.00		1100		330 U	
Acenaphthylene	190		280		210		520		130		380		680		940		330 U	
Anthracene	270		270		230		950		150		820		680		3200		330 U	
Benzo(a)anthracene	870		730		880		3300		480		1800		2400		11000		190 J	
Benzo(a)pyrene	840		950		800		2900		540		2000		3300		9700		230 J	
Benzo(b)fluoranthene	990		1400		1100		4400		770		2600		4500		8800		400 XJ	
Benzo(e)pyrene	540		820		980		2300		730		1500		3000		7800			
Benzo(g,h,i)perylene	490		780		880		1900		820		1400		3200		7200		74.00 J	
Benzo(k)fluoranthene	330		410		930		970		690		710		2800		8500		390 XJ	
Biphenyl	18.00		14.00		10.00 U		86.00		7.50 U		30.00		35.00		340			
Chrysene	770		970		1100		3300		750		1800		2800		8700		220 J	
Dibenz(a,h)anthracene	120		170		170		480		120		320		640		1500		330 U	
Fluoranthene	1200		1600		1700		6200		1200		3200		5700		21000		330 J	
Fluorene	24.00		28.00		10.00 U		140		7.50 U		78.00		84.00		920		330 U	
Sum PAHs (6 High Molecular Weight) <sup>1</sup>	3980		4590		4590		16790		3180		9540		15520		54300		1300	
Indeno(1,2,3-cd)pyrene	570		880		1000		2400		710		1800		3800		8500		110 J	
Sum PAHs (7 Low Molecular Weight) <sup>2</sup>	1024		1893		1443		4266		908		2695		3862		14240		2100	
Naphthalene	60.00		84.00		67.00		41.00		38.00		62.00		200		150		330 U	
Perylene	180		170		180		630		110		420		680		2400			
Phenanthrene	390 B		980 B		870 B		2500 B		550 B		1500 B		2100 B		7800 B		120 J	
Pyrene	1200		1700		1800		6200		1100		3300		5800		17000		410 J	
Sum PAHs	9328		12408		12727		39838		8831		23892		42335		127320		7084	

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1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene,

Dibenz(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene,

Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077,104, and 154.

4 - Dioxin = 2,3,7,8 TCDD Equivalent; see Appendix D-3

5 - Reference Station - GM08 (SAIC, 1998). Total PCBs = 16 Congeners x 2.

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-SED-SMP	C-2-SED-SMP	C-3-SED-SMP	C-4-SED-SMP	C-5-SED-SMP	C-6-SED-SMP	C-7-SED-SMP	C-8-SED-SMP	C-9-SED-SMP	C-10-SED-SMP
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
<b>Organochlorine Pesticides (µg/kg)</b>										
Aldrin	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Alpha-BHC	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Alpha-Chlordane	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Beta-BHC	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Delta-BHC	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Dieldrin	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Endosulfan I	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Endosulfan II	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Endosulfan Sulfate	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Endrin	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Endrin Aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-BHC(Lindane)	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Gamma-Chlordane	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Heptachlor	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Heptachlor Epoxide	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Hexachlorobenzene	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Methoxychlor	1.90 U	2.85 U	2.90 U	2.00 U	3.25 U	1.85 U	2.85 U	2.05 U	2.00 U	2.00 U
Mirex	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
o,p'-DDD	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
o,p'-DDE	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
o,p'-DDT	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
p,p'-DDD	0.39 U	3.80	0.60 U	0.40 U	0.65 U	0.33 U	3.70	20.00	1.80	1.80
p,p'-DDE	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
p,p'-DDT	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	0.42 U	0.40 U	0.40 U
Toxaphene	4.80 U	7.00 U	7.00 U	5.00 U	8.00 U	4.10 U	7.00 U	5.00 U	5.00 U	5.00 U
<b>Polychlorinated Biphenyls (PCBs) (µg/kg)</b>										
PCB008	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	320	0.40 U	0.40 U
PCB018	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB028	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	2.50	41.00	1.30	1.30
PCB029	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB044	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	4.50	230	0.40 U	0.40 U
PCB050	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB052	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	3.80	1000	2.30	2.30
PCB066	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	2.90	8.20	20.50 U	0.40 U	0.40 U
PCB077	0.39 U	3.50	0.60 U	0.40 U	0.65 U	4.70	0.55 U	20.50 U	0.40 U	0.40 U
PCB087	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB101	4.70	9.70	0.60 U	0.40 U	0.65 U	0.33 U	17.00	160	0.40 U	0.40 U
PCB104	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB105	0.95	4.60	2.20	0.40 U	0.65 U	1.20	2.60	20.50 U	1.70	1.70
PCB118	0.97	1.80	0.60 U	0.40 U	0.65 U	5.10	3.50	120	0.40 U	0.40 U
PCB126	0.39 U	2.40	3.20	0.40 U	0.65 U	0.33 U	1.30	20.50 U	0.40 U	0.40 U
PCB128	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB138	0.94	2.20	0.60 U	0.40 U	0.65 U	1.70	4.10	150	1.40	1.40
PCB153	1.10	4.70	0.60 U	0.40 U	0.65 U	1.10	5.00	150	2.20	2.20
PCB154	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	2.00	0.55 U	20.50 U	0.40 U	0.40 U
PCB170	0.39 U	12.00	0.60 U	0.40 U	0.65 U	2.90	0.55 U	20.50 U	0.40 U	0.40 U
PCB180	2.40	7.40	8.00	0.40 U	0.65 U	0.33 U	9.00	49.00	3.90	3.90
PCB187	1.50	6.40	4.90	0.40 U	0.65 U	0.33 U	5.10	20.50 U	3.20	3.20
PCB188	0.39 U	1.60	0.60 U	0.40 U	0.65 U	1.40	1.90	20.50 U	1.20	1.20
PCB195	0.39 U	4.20	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB200	0.39 U	0.55 U	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
PCB206	0.39 U	10.00	0.60 U	0.40 U	0.65 U	0.33 U	20.00	20.50 U	4.00	4.00
PCB209	0.39 U	6.50	0.60 U	0.40 U	0.65 U	0.33 U	0.55 U	20.50 U	0.40 U	0.40 U
Total PCBs (Sum of Congeners x 2) <sup>3</sup>	38.21	159	60.60	19.20	35.90	43.65	188	5055	55.80	55.80
<b>Dioxins (ng/kg)</b>										
Dioxin-Mammal	4.81	13.36	10.04	2.34	2.83	25.62	13.36	227	5.07	5.07
Dioxin-Fish	4.30	11.82	9.17	2.23	2.56	23.38	12.12	223	4.64	4.64
Dioxin-Bird	6.34	22.76	19.57	2.53	3.71	37.49	25.36	324	8.24	8.24

DQ = Data Qualifier: "U"=Undetected; "E"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077, 104, and 154.

4 - Dioxin = 2,3,7,8 TCDD Equivalent; see Appendix D-3.

5 - Reference Station - GMO8 (SAIC, 1998). Total PCBs = 16 Congeners x 2.

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	D-6-SED-FD		E-1-SED-SMP		E-2-SED-SMP		E-3-SED-SMP		E-4-SED-SMP		F-1-SED-SMP		F-2-SED-SMP		F-3-SED-SMP		Reference <sup>1</sup>	
	DQ		DQ		DQ		DQ		DQ		DQ		DQ		DQ		DQ	
<b>Organochlorine Pesticides (<math>\mu\text{g/kg}</math>)</b>																		
Aldrin	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Alpha-BHC	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Alpha-Chlordane	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Beta-BHC	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Delta-BHC	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Dieldrin	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Endosulfan I	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Endosulfan II	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Endosulfan Sulfate	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Endrin	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Endrin Aldehyde	NA		NA		NA		NA		NA		NA		NA		NA			
Gamma-BHC(Lindane)	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Gamma-Chlordane	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Heptachlor	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Heptachlor Epoxide	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Hexachlorobenzene	0.55	U	11.00		4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Methoxychlor	2.70	U	6.00	U	20.50	U	4.65	U	15.00	U	4.45	U	13.50	U	18.00	U		
Mirex	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
p,p'-DDD	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
p,p'-DDE	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	7.30		2.70	U	3.60	U		
p,p'-DDT	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
p,p'-DDD	0.55	U	1.25	U	23.00		0.90	U	24.00		36.00		70.00		120			
p,p'-DDE	0.55	U	1.25	U	4.10	U	4.00		3.05	U	0.90	U	30.00		99.00			
p,p'-DDT	0.55	U	1.25	U	4.10	U	0.90	U	3.05	U	4.20		24.00		3.60	U		
Toxaphene	7.00	U	15.50	U	50.00	U	11.50	U	38.00	U	11.00	U	33.50	U	45.00	U		
<b>Polychlorinated Biphenyls (PCBs) (<math>\mu\text{g}</math>)</b>																		
PCB006	0.55	U	170		4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB016	0.55	U	3000		4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB026	0.55	U	1700		28.00		0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB029	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB044	0.55	U	820		19.00		0.90	U	15.00		0.90	U	2.70	U	25.00			
PCB050	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB052	0.55	U	2000		23.00		0.90	U	9.80		0.90	U	2.70	U	3.60	U		
PCB066	1.90		2100		54.00		0.90	U	32.00		0.90	U	5.40		3.60	U		
PCB077	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB087	0.55	U	680		20.00		0.90	U	3.05	U	0.90	U	2.70	U	9.40			
PCB101	0.55	U	2700		53.00		0.90	U	18.00		0.90	U	170		16.00			
PCB104	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB105	0.55	U	580		36.00		0.90	U	16.00		13.00		26.00		98.00			
PCB118	0.55	U	1600		36.00		0.90	U	14.00		0.90	U	24.00		33.00			
PCB126	0.55	U	140		4.10	U	0.90	U	3.05	U	0.90	U	9.30		18.00			
PCB128	0.55	U	520		4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB136	0.55	U	1900		42.00		5.80		15.00		9.20		21.00		20.00			
PCB153	0.55	U	1500		37.00		8.40		12.00		5.70		23.00		45.00			
PCB154	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB170	0.55	U	400		4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB180	7.70		330		21.00		0.90	U	12.00		17.00		56.00		3.60	U		
PCB187	3.50		150		13.00		13.00		9.70		16.00		40.00		29.00			
PCB188	1.50		210		4.10	U	0.90	U	3.05	U	5.80		11.00		20.00			
PCB195	2.00		60.00	U	4.10	U	0.90	U	3.05	U	4.50		5.40		3.60	U		
PCB200	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
PCB206	5.10		60.00	U	16.00		0.90	U	3.05	U	30.00		31.00		15.00			
PCB208	0.55	U	60.00	U	4.10	U	0.90	U	3.05	U	0.90	U	2.70	U	3.60	U		
Total PCBs (Sum of Congeners x 2) <sup>3</sup>	63.20		41680		886		92.20		362		231		919		750		75.17	
<b>Dioxins<sup>4</sup> (ng/kg)</b>																		
Dioxin-Mammal	13.50		231		32.70		14.46		36.44		13.54		43.36		16.63		9.07	
Dioxin-Fish	13.23		203		29.48		14.11		32.37		12.08		35.08		15.29		7.57	
Dioxin-Bird	22.14		440		59.09		23.75		47.03		26.33		66.96		35.14		16.75	

DQ = Data Qualifier; "U"=Undetected; "E"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene,

Dibenz(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077, 104, and 154.

4 - Dioxin = 2,3,7,8-TCDF equivalent, see Appendix D-3.

5 - Reference Station - GMOB (SAR, 1998). Total PCBs = 16 Congeners x 2.

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-SED-SMP	C-2-SED-SMP	C-3-SED-SMP	D-1-SED-SMP	D-2-SED-SMP	D-3-SED-SMP	D-4-SED-SMP	D-5-SED-SMP	D-6-SED-SMP
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
AVS/SEM (μmol/g dry wt)									
Acid Volatile Sulfide	11.81	16.22	0.30	<0.1	4.29	1.79	13.95	2.62	5.68
Cadmium	1.00E-03 J	1.00E-03 J	2.00E-03	1.00E-03 J	2.00E-03 J	9.00E-03	4.00E-03	2.00E-03	3.00E-03
Copper	0.05 J	0.12 J	0.39 J	0.06 J	0.06 J	0.76 J	0.57 J	0.10 J	0.07 J
Lead	0.07 J	0.15 J	0.26 J	0.02 J	0.05 J	0.29 J	0.17 J	0.13 J	0.09 J
Nickel	0.05 J	0.09 J	0.06 J	0.05 J	0.08 J	0.28 J	0.63 J	0.37 J	0.35 J
SEM-AVS	-9.49	-10.99	4.64	n/a	-1.36	5.23	-12.48	-0.32	-1.57
SEM/AVS	0.20	0.32	16.45	n/a	0.68	3.92	0.11	0.88	0.72
Zinc	2.14 J	4.87 J	4.21 J	0.55 J	2.75 J	5.68 J	0.10 J	1.70 J	3.60 J
Grain Size (%)									
Clay	0.30	1.20	1.00	0.20	0.70	0	1.10	0	0.20
Sand	78.60	43.70	26.90	59.40	31.20	98.30	40.70	93.20	79.00
Silt	21.10	55.10	72.10	40.40	68.10	1.70	58.10	6.70	20.80

DQ = Data Qualifier: "U"=Undetected; "J"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077,104, and 154.

4 - Dioxin = 2,3,7,8 TCDD Equivalent; see Appendix D-3.

5 - Reference Station - GMOB (SAIC, 1998). Total PCBs = 16 Congeners x 2.

Appendix A-1. Sediment Chemical Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	D-SED-FD	E-1-SED-SMP	E-2-SED-SMP	E-3-SED-SMP	E-4-SED-SMP	F-1-SED-SMP	F-2-SED-SMP	F-3-SED-SMP	Reference <sup>5</sup>
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
AVS/SEM (μmol/g dry wt)									
Acid Volatile Sulfide	12.52	22.22	16.77	<0.1	13.38	124	83.45	27.01	9.40
Cadmium	7.00E-03	#####	#####	#####	4.00E-03	0.02	0.05	0.02	0.01
Copper	0.17 J	1.80 J	2.33 J	1.05 J	2.82 J	0.30 J	0.11 J	0.78 J	0.32
Lead	0.27 J	1.19 J	0.48 J	0.31 J	0.55 J	0.68 J	1.64 J	1.31 J	0.41
Nickel	0.54 J	1.63 J	0.31 J	0.29 J	0.45 J	0.34 J	0.79 J	1.12 J	0.15
SEM-AVS	-2.68	-2.38	0.35	n/a	-6.25	-112.11	-63.73	-5.78	-4.87
SEM-AVS	0.79	0.89	1.02	n/a	0.53	0.10	0.24	0.79	0.48
Zinc	8.86 J	15.21 J	14.00 J	4.81 J	3.50 J	10.97 J	17.13 J	18.01 J	3.63
Grain Size (%)									
Clay	0.50	1.10	1.70	0.80	2.10	0.40	2.00	1.10	0
Sand	41.30	7.30	5.90	40.50	4.60	80.90	18.40	58.70	78.33
Silt	58.20	91.60	92.50	58.70	93.30	18.70	79.60	42.20	21.67

DQ = Data Qualifier; "U"=Undetected; "J"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene,

Dibenz(a,h)anthracene, Fluoranthene, and Perylene; Perylene not available for Reference

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene,

Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077, 104, and 154.

4 - Dioxin = 2,3,7,8 TCDD Equivalent; see Appendix D-3.

5 - Reference Station - GMO6 (SAIC, 1998). Total PCBs = 16 Congeners x 2.



**APPENDIX A-2**  
**RESULTS OF POREWATER CHEMICAL ANALYSES:**  
**METALS**

## Appendix A-2. Sediment Porewater Analysis Results for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-PW	DQ	C-2-PW	DQ	C-3-PW	DQ	D-1-PW	DQ	D-2-PW	DQ	D-3-PW	DQ	D-4-PW	DQ	D-5-PW	DQ	D-6-PW	DQ	D-6-FD	DQ	E-1-PW	DQ	E-2-PW	DQ	E-3-PW	DQ	E-4-PW	DQ	F-1-PW	DQ	F-2-PW	DQ	F-3-PW	DQ	Reference <sup>1</sup>	DQ		
Metals (mg/kg)																																						
Arsenic	42.9		12.4		5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	5.0	U,B	10.5		29.1		10.3		5.0	U,UJ	5.0	U,UJ	5.0	U,UJ	10.5		20.10			
Cadmium	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.4		0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.1	U,B	0.17			
Chromium	3.8		9.3		2.0		0.4	U,B	1.5		0.4	U,B	2.5		1.4		1.0		5.1		2.9		13.7		1.0		3.4		1.5		3.5		0.6		1.69			
Copper	1.3	U	1.3	U	1.3	U	1.3	U	2.9		11.2		1.3	U	1.3	U	1.3	U	1.3	U	20.8		15.4		5.1		2.9		1.3	U	5.9		1.3	U	55.00			
Lead	1.45	U,UJ	1.45	U,UJ	3.3	J	3.2	J	1.45	U,J	3.7	J	1.45	U,UJ	1.45	U,UJ	1.45	U,UJ	1.45	U,UJ	1.45	U,UJ	34.6		1.45	U,UJ	3.7	J	1.45	U,UJ	1.45	U,UJ	1.45	U,UJ	1.56			
Mercury	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA			
Nickel	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	4	U,B	8.3		9.9		4	U,B	4	U,B	4	U,B	4	U,B	32.00	
Silver	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	0.3	U,UJ	1.00E-03	
Zinc	1.5	U,B	5.5	J	12.7	J	17.9	J	1.5	U,B	32.7	J	9.2	J	6.8	J	4.1	J	16.1	J	1.5	U,B	1.5	U,B	7.9	J	11.6	J	9.4	J	28.8	J	4.5	J	420			

U = Concentrations in µg/L below the Limit of Quantitative Detection (LOQ); value reported = 1/2 LOQ.

B = Below the Contract Required Detection Limit.

UJ = Uncertainty associated with the reported detection limits.

J = Estimated.

1 - Reference Station - GMOB (SAIC, 1998).

**APPENDIX A-3**  
**RESULTS OF TISSUE CHEMICAL ANALYSES:**  
**ORGANICS, METALS, AND LIPIDS**

Appendix A-3. Concentrations of CoCs in Ribbed Mussels collected for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-TISS-SMP	C-2-TISS-SMP	C-3-TISS-SMP	D-1-TISS-SMP	D-2-TISS-SMP	D-3-TISS-SMP	D-4-TISS-SMP	D-6-TISS-SMP	W-6-TISS-SMP
	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
Lipid Content	2.00	1.40	2.80	3.90	4.00	2.00	3.10	2.60	2.20
<b>Metals (mg/kg dw)</b>									
Arsenic	2.00 J	2.20 J	2.10 J	1.60 J	2.60 J	3.60 J	3.20 J	2.70 J	2.30 J
Cadmium	0.44 J	0.67 J	0.51 J	0.74 J	0.49 J	0.99 J	0.57 J	1.10 J	0.56 J
Chromium	1.20	1.70	2.30	1.00	0.85	1.00	1.80	2.80	1.20
Copper	24.20	42.60	37.10	16.70	19.90	18.10	20.50	29.80	26.30
Lead	1.10	1.60	2.20	0.95	0.69	0.93	1.00	1.80	1.00
Mercury	0.10	0.11	0.10	0.09	0.08	0.10	0.10	0.14	0.10
Nickel	0.84	0.73	0.62	0.50	0.52	0.57	0.69	0.75	0.51
Silver	1.20	1.90	1.10	0.65	1.00	0.91	1.10	0.84	1.10
Zinc	68.20	60.50	58.20	59.10	58.40	68.80	66.50	70.00	62.90
<b>Polycyclic Aromatic Hydrocarbons (PAHs) (µg/kg dw)</b>									
1,6,7-Trimethylnaphthalene	5.50 U	5.50 U	5.50 U	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
1-Methylnaphthalene	90.00	97.00	110	97.00	140	94.00	180	93.00	70.00
1-Methylphenanthrene	5.50 U	5.50 U	5.50 U	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
2,6-Dimethylnaphthalene	5.50 U	5.50 U	5.50 U	5.00 U	20.00	5.50 U	6.50 U	6.00 U	5.50 U
2-Methylnaphthalene	91.00	85.00	110	130	160	100.00	140	110	80.00
Acenaphthene	23.00	15.00	17.00	25.00	24.00	19.00	29.00	16.00	12.00
Acenaphthylene	5.50 U	5.50 U	12.00	14.00	15.00	5.50 U	14.00	6.00 U	5.50 U
Anthracene	5.50 U	5.50 U	5.50 U	12.00	12.00	5.50 U	6.50 U	6.00 U	5.50 U
Benzo(a)anthracene	15.00	13.00	25.00	26.00	32.00	14.00	22.00	22.00	17.00
Benzo(a)pyrene	5.50 U	5.50 U	13.00	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
Benzo(b)fluoranthene	5.50 U	5.50 U	17.00	14.00	21.00	5.50 U	6.50 U	6.00 U	5.50 U
Benzo(e)pyrene	5.50 U	5.50 U	15.00	24.00	27.00	5.50 U	20.00	18.00	17.00
Benzo(g,h,i)perylene	5.50 U	5.50 U	19.00	5.00 U	15.00	5.50 U	6.50 U	6.00 U	5.50 U
Benzo(k)fluoranthene	5.50 U	5.50 U	17.00	11.00	18.00	5.50 U	6.50 U	6.00 U	5.50 U
Biphenyl	5.50 U	5.50 U	5.50 U	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
Chrysene	12.00	5.50 U	22.00	20.00	28.00	5.50 U	15.00	15.00	16.00
Dibenz(a,h)anthracene	5.50 U	5.50 U	12.00	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
Fluoranthene	33.00	25.00	44.00	74.00	71.00	32.00	54.00	41.00	37.00
Fluorene	5.50 U	5.50 U	13.00	16.00	18.00	11.00	17.00	6.00 U	5.50 U
Sum PAHs (6 High Molecular Weight) <sup>1</sup>	76.50	60.00	122	135	152	68.00	111	96.00	86.50
Indeno(1,2,3-cd)pyrene	5.50 U	5.50 U	16.00	5.00 U	5.00 U	5.50 U	6.50 U	6.00 U	5.50 U
Sum PAHs (7 Low Molecular Weight) <sup>2</sup>	405	383	472	482	572	406	577	388	308
Naphthalene	210	210	230	200	250	190	260	180	140
Perylene	5.50 U	5.50 U	5.50 U	5.00 U	11.00	5.50 U	6.50 U	6.00 U	5.50 U
Phenanthrene	64.00	56.00	84.00	85.00	93.00	75.00	110	64.00	59.00
Pyrene	63.00	57.00	83.00	150	140	73.00	100.00	100.00	68.00
Sum PAHs	684	646	892	943	1125	691	1019	743	593

DQ = Data Qualifier: "U"=Undetected; "J"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

Tissue sample analyzed = ribbed mussels.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, and Perylene.

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077, 104, and 154.

Appendix A-3. Concentrations of CoCs in Ribbed Mussels collected for the Raymark Phase III Ecological Risk Assessment Investigation.

	C-1-TISS-SMP		C-2-TISS-SMP		C-3-TISS-SMP		D-1-TISS-SMP		D-2-TISS-SMP		D-3-TISS-SMP		D-4-TISS-SMP		D-6-TISS-SMP		HB-9-TISS-SMP	
		DQ		DQ		DQ		DQ		DQ		DQ		DQ		DQ		DQ
<b>Organochlorine Pesticides (µg/kg dw)</b>																		
Aldrin	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Alpha-BHC	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Alpha-Chlordane	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Beta-BHC	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Delta-BHC	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Dieldrin	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Endosulfan I	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Endosulfan II	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Endosulfan Sulfate	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Endrin	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Endrin Aldehyde	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Gamma-BHC(Lindane)	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Gamma-Chlordane	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Heptachlor	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Heptachlor Epoxide	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Hexachlorobenzene	2.30	UJ	2.20	UJ	2.15	UJ	1.95	UJ	2.00	UJ	2.15	UJ	2.60	UJ	2.50	UJ	2.10	UJ
Methoxychlor	5.50	U	5.50	U	5.50	U	4.90	U	5.00	U	5.50	U	6.50	U	6.00	U	5.00	U
Mirex	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
o,p'-DDD	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
o,p'-DDE	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
o,p'-DDT	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
p,p'-DDD	2.30	U	2.20	U	6.80		16.00		8.40		2.15	U	2.60	U	2.50	U	2.10	U
p,p'-DDE	2.30	U	2.20	U	2.15	U	8.40		7.10		2.15	U	2.60	U	2.50	U	2.10	U
p,p'-DDT	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Toxaphene	14.50	U	13.50	U	13.50	U	12.00	U	12.50	U	13.50	U	16.00	U	15.50	U	13.00	U
<b>Polychlorinated Biphenyls (PCBs) (µg/kg dw)</b>																		
PCB008	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB018	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	UJ	2.10	UJ
PCB028	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB029	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB044	2.30	U	2.20	U	2.15	U	16.00		6.30		2.15	U	8.90		2.50	U	2.10	U
PCB050	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB052	2.30	U	2.20	U	2.15	U	6.80		5.00		2.15	U	7.70		2.50	U	2.10	U
PCB066	2.30	U	2.20	U	2.15	U	6.80		9.20		2.15	U	2.60	U	2.50	U	2.10	U
PCB077	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB087	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB101	2.30	U	2.20	U	10.00		15.00		16.00		6.00		11.00		9.50		4.90	
PCB104	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB105	2.30	U	2.20	U	2.15	U	4.50		5.90		2.15	U	2.60	U	2.50	U	2.10	U
PCB118	2.30	U	2.20	U	2.15	U	1.95	U	4.90		2.15	U	6.70		6.00		2.10	U
PCB126	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB128	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB138	2.30	U	2.20	U	2.15	U	12.00		10.00		2.15	U	8.80		7.20		6.00	
PCB153	2.30	U	2.20	U	7.80		13.00		21.00		9.00		15.00		14.00		7.40	
PCB154	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB170	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB180	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB187	2.30	U	2.20	U	9.40		16.00		11.00		4.50		11.00		8.00		6.10	
PCB188	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	4.40	
PCB195	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB200	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB206	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
PCB209	2.30	U	2.20	U	2.15	U	1.95	U	2.00	U	2.15	U	2.60	U	2.50	U	2.10	U
Sum of Congeners x 2 <sup>1</sup>	110		106		145		243		239		129		227		184		137	

DQ = Data Qualifier: "U"=Undetected; "J"=Estimated; "B"=Below CRDL; and "NA"=Not Analyzed.

Tissue sample analyzed = ribbed mussels.

One-half the MDL taken where DQ = "U".

1 - Sum of High Molecular Weight PAHs = Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, and Perylene.

2 - Sum of Low Molecular Weight PAHs = 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.

3 - Sum of Congeners x 2 does not include PCB077,104, and 154.

APPENDIX B  
EFFECTS DATA

**APPENDIX B-1**  
**TOXICOLOGICAL EVALUATION OF SEVENTEEN SEDIMENTS:**  
**RAYMARK 1999**

TOXICOLOGICAL EVALUATION  
OF SEVENTEEN SEDIMENTS:

Raymark 1999

Prepared For:

Science Applications International Corporation  
221 Third Street  
Admiral's Gate  
Newport, Rhode Island 02840

Prepared By:

EnviroSystems, Incorporated  
1 Lafayette Road  
Hampton, New Hampshire 03842

May 5, 1999  
Reference SAIC7814-99-04



## TOXICOLOGICAL EVALUATION OF SEVENTEEN SEDIMENTS:

Raymark 1999

### 1.0 SAMPLE RECEIPT AND STORAGE

Seventeen (17) sediments were collected by Science Applications International Corporation (SAIC), Newport, Rhode Island on April 16, 1999. Each sample was placed in a one gallon polyethylene jug and shipped on ice to EnviroSystems, Incorporated (ESI), Hampton, New Hampshire. Samples were received at ESI on April 20, 1999. Control sediment for the amphipod assay was provided by the organism supplier.

At ESI, samples were given identification numbers and refrigerated at 2-4 °C until test initiation.

### 2.0 TEST ORGANISMS

The 10 day acute solid phase assay was conducted using *Ampelisca abdita*, obtained from Eastern Aquatic Biosupply of Kingstown, Rhode Island. Prior to use, test organisms were held for two days under conditions of temperature, salinity, and photoperiod similar to those to be used in the assay. *A. abdita* used in the assay were adults between 2 and 3 mm in length.

### 3.0 TEST METHODOLOGY

#### 3.1 April 21, 1999 (Day -2)

Test and control sediments were all sieved (1 mm) to remove macroinvertebrates, large shell hash, and rocks prior to use in the assays. Each test sediments consisted on five replicates. Each replicate contained approximately 175 mL of sediment and 725 mL of natural sea water in a 1 liter beaker. The overlying water in each test vessel was gently aerated and test chambers were allowed to stabilize overnight.

Client: Science Applications International Corporation.  
Date: April 23, 1999

Project: Raymark 1999.  
Study: 7814.

### 3.2 April 22, 1999 (Day -1)

A pore water ammonia sample was taken and measured for one replicate of each test sediment. As the level of un-ionized ammonia in the pore water was  $\leq 0.2$  mg/L (half of the acute LC-50 value of 0.40 mg/L for the amphipod, *Ampelisca abdita*) the sediments did not need to be "washed" to reduce total ammonia levels. The concentration of un-ionized ammonia was determined based on ammonia concentrations, temperature, and pH using tables provided by the U.S. EPA (1979). (Salinity was not factored into the determination of percent un-ionized ammonia. Information provided in the U.S. EPA document indicated that the effect of salinity on percent un-ionized ammonia in the sample was small.)

### 3.3 April 23, 1999 (Day 0)

Pore water ammonia samples were taken and measured. Dissolved oxygen, temperature, pH, and salinity in aliquots of overlying water from each test vessel were recorded. It was noted that the pH of the overlying water for sediment "E-4-SED-SMP," ranged from 3.71 SU to 4.41 SU. To minimize the impact low pH could have on organism survival, the overlying water in these test replicates was decanted, replenished, and allowed to settle for a minimum of four hours.

A total of 20 amphipods were indiscriminately selected from the pool of organisms and randomly added to each test and control sediment replicate. Five true replicates were used for each treatment. Water temperature was  $20 \pm 2^\circ\text{C}$ , and the salinity regime was established at  $28 \pm 2\text{‰}$ . The photoperiod was set at 24 hours light and 0 hours dark.

### 3.4 April 24, 199 - May 2, 1999 (Days 1-9)

Temperature, salinity, pH, and dissolved oxygen in each test replicate were recorded daily. In cases where salinity exceeded 30 ppt overnight, salinity was corrected to  $28 \pm 2$  ppt using spring water. Overlying water lost to evaporation was replenished as needed. Samples were not renewed during the ten day exposure period.

On Day 2, the pH values of overlying water for the E-4-SED-SMP sediment ranged from 5.04 to 6.84 SU. In this case, the overlying water was decanted and replaced taking care not to disturb the test organisms.

Client: Science Applications International Corporation.  
Date: April 23, 1999

Project: Raymark 1999.  
Study: 7814.

### 3.5 May 3, 1999 (Day 10)

Temperature, salinity, pH, and dissolved oxygen in each test replicate were recorded. The test sediment from each replicate was sifted using a 750  $\mu$  sieve, organisms were recovered, and survival was recorded.

### 4.0 REFERENCE TOXICANT EVALUATION

As part of the laboratory quality control program, reference toxicant evaluations are conducted on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. A reference toxicant assay was conducted on April 27, 1999 using cadmium chloride. The assay resulted in a 96 hour LC-50 value of 0.1 mg/L Cadmium (Probit Analysis). This value was within one standard deviation of the historic mean for the species.

### 5.0 LITERATURE CITED

U.S. EPA 1979. Aqueous Ammonia Equilibrium - Tabulation of Percent Un-ionized Ammonia. EPA-600/3-79/091. 437 pages

CLIENT: SAIC  
 STUDY: 7814  
 PROJECT: RAYMARK 1999  
 PARAMETER: Ampelisa abdita 10 Day Chronic Assay Survival

SITE	SURVIVAL Replicate					MEAN
	A	B	C	D	E	
LAB CONTROL	90%	100%	90%	80%	100%	92%
C-1-SED-SMP	65%	65%	45%	25%	45%	49%
C-2-SED-SMP	70%	60%	75%	15%	25%	49%
C-3-SED-SMP	5%	15%	10%	0%	0%	6%
D-1-SED-SMP	85%	90%	85%	45%	60%	73%
D-2-SED-SMP	75%	80%	70%	25%	25%	55%
D-3-SED-SMP	50%	60%	50%	35%	35%	46%
D-4-SED-SMP	70%	80%	60%	55%	20%	57%
D-5-SED-SMP	60%	85%	50%	60%	60%	63%
D-6-SED-SMP	0%	15%	0%	0%	0%	3%
D-6-SED-FD	0%	0%	0%	0%	0%	0%
E-1-SED-SMP	55%	70%	75%	45%	70%	63%
E-2-SED-SMP	60%	80%	55%	55%	40%	58%
E-3-SED-SMP	80%	95%	55%	70%	40%	68%
E-4-SED-SMP	40%	50%	65%	45%	25%	45%
F-1-SED-SMP	45%	50%	65%	70%	45%	55%
F-2-SED-SMP	85%	60%	75%	80%	80%	76%
F-3-SED-SMP	70%	60%	80%	65%	50%	65%

COMMENTS:

Survival in Replicate "E" from the laboratory control sediment is based on recovery of 10 organisms from an original 10 added to the test vessel.

CLIENT: SAIC  
STUDY: 7814  
PROJECT: RAYMARK 1999  
PARAMETER: Ammonia Data

SITE	Ammonia Concentration, mg/L			
	Exposure (Day)			
	-1	0	5	10
LAB CONTROL	0.40	0.81	0.70	<0.05
C-1-SED-SMP	2.92	2.87	4.30	2.58
C-2-SED-SMP	1.93	2.42	3.52	0.44
C-3-SED-SMP	0.72	1.02	1.40	<0.05
D-1-SED-SMP	0.08	0.06	0.59	0.45
D-2-SED-SMP	1.70	0.94	2.51	0.11
D-3-SED-SMP	1.61	3.28	1.74	<0.05
D-4-SED-SMP	1.35	1.12	5.88	2.00
D-5-SED-SMP	4.01	<0.05	2.32	<0.05
D-6-SED-SMP	1.50	1.82	3.03	<0.05
D-6-SED-FD	1.71	1.89	4.36	1.43
E-1-SED-SMP	2.68	1.41	<0.05	2.66
E-2-SED-SMP	4.91	3.90	<0.05	2.80
E-3-SED-SMP	4.67	2.78	<0.05	3.28
E-4-SED-SMP	2.57	2.52	2.04	2.00
F-1-SED-SMP	3.45	4.71	3.81	3.82
F-2-SED-SMP	5.24	3.07	4.08	5.80
F-3-SED-SMP	4.22	4.28	4.87	5.32

COMMMMENTS:

Ammonia on Days -1 and 0 were measured on aliquots of pore water.  
Ammonia on Days 5 and 10 were measured on aliquots of the overlying water.

CLIENT: SAIC  
 STUDY NUMBER: 7814  
 PROJECT: RAYMARK 1999  
 PARAMETER: Water Quality Data

CONTROL:

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	7.93	30	22	6.8	7.94	30	22	6.9	7.96	30	22	6.9	7.95	30	22	6.9	7.95	30
1	22	6.4	7.77	32	22	6.7	7.92	32	22	6.8	7.86	32	22	6.8	7.86	32	22	6.8	7.77	32
2	22	7.2	7.92	29	22	7.2	7.94	30	22	7.1	7.98	30	22	7.0	7.98	30	22	6.9	7.95	30
3	22	7.5	7.98	29	22	7.5	7.98	28	22	7.6	7.97	29	22	7.5	7.94	28	22	7.6	7.95	29
4	22	7.0	7.87	31	22	6.8	7.89	31	22	6.8	7.90	30	22	6.8	7.83	31	22	6.7	7.88	31
5	22	7.0	8.07	30	22	6.9	8.00	30	22	6.8	7.99	30	22	6.7	8.03	30	22	6.8	8.09	30
6	22	7.1	7.98	30	22	7.1	7.97	30	22	7.1	7.96	30	22	7.1	7.95	30	22	7.1	7.96	30
7	22	7.1	7.87	30	22	7.1	7.86	30	22	7.1	7.86	30	22	7.1	7.86	30	22	7.1	7.91	30
8	21	7.2	7.90	29	21	7.2	6.92	29	21	7.2	6.87	28	21	7.2	7.08	29	21	7.1	7.96	31
9	21	5.9	8.03	30	21	5.9	8.06	30	21	6.1	8.06	29	21	6.1	8.07	28	21	6.3	8.07	29
10	21	6.3	8.18	30	21	6.4	8.19	30	21	6.4	8.17	30	21	6.4	8.17	30	21	6.3	8.17	30

C-1-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.8	8.01	29	22	6.8	8.01	29	22	6.8	7.99	29	22	6.7	8.00	29	22	6.7	8.02	29
1	22	6.6	7.99	31	22	6.4	8.01	31	22	6.4	8.01	31	22	6.4	8.00	31	22	6.3	8.01	31
2	22	6.8	8.00	30	22	7.0	8.10	29	22	6.9	8.10	29	22	6.9	8.10	28	22	6.9	8.09	28
3	22	7.4	8.12	29	22	7.4	8.12	27	22	7.4	8.12	29	22	7.3	8.11	27	22	7.4	8.10	29
4	22	6.8	8.12	31	22	6.9	8.16	31	22	6.6	8.15	30	22	6.8	8.14	31	22	6.7	8.15	30
5	22	6.8	8.37	30	22	6.8	8.37	30	22	6.7	8.30	30	22	6.7	8.35	30	22	6.7	8.33	30
6	22	6.9	8.31	30	22	7.1	8.32	30	22	7.1	8.31	30	22	6.5	8.18	30	22	6.9	8.28	30
7	22	7.0	8.18	30	22	7.1	8.29	30	22	7.1	8.28	30	22	6.9	8.25	29	22	6.9	8.25	30
8	21	7.1	8.06	28	21	7.0	7.32	28	21	7.3	8.30	29	21	7.2	8.32	30	21	7.1	8.34	30
9	21	6.3	8.41	28	21	6.2	8.42	30	21	6.3	8.42	29	21	6.1	8.44	29	21	6.3	8.42	30
10	21	6.3	8.48	29	21	6.1	8.46	29	21	6.0	8.48	29	21	6.2	8.47	29	21	6.1	8.47	30

CLIENT: SAIC  
 STUDY NUMBER: 7814  
 PROJECT: RAYMARK 1999  
 PARAMETER: Water Quality Data

**C-2-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.7	8.02	28	22	6.8	8.04	28	22	6.8	7.98	28	22	6.7	7.99	28	22	6.7	8.03	28
1	22	6.6	8.00	31	22	6.6	8.01	31	22	6.4	7.98	31	22	6.5	7.99	31	22	6.5	7.97	31
2	22	6.4	8.09	29	22	6.8	8.09	28	22	7.0	8.09	28	22	7.1	8.10	28	22	7.1	8.11	28
3	22	7.3	8.17	29	22	7.3	8.11	29	22	7.3	8.12	28	22	7.3	8.14	28	22	7.2	8.14	28
4	22	6.9	8.14	29	22	6.8	8.13	30	22	6.7	8.14	30	22	6.8	8.13	29	22	6.9	8.14	29
5	22	6.6	8.35	30	22	5.6	8.08	30	22	6.5	8.30	30	22	6.6	8.32	30	22	6.6	8.24	30
6	22	6.9	8.29	30	22	7.0	8.28	29	22	7.0	8.27	29	22	7.0	8.27	29	22	7.0	8.26	29
7	22	7.0	8.27	29	22	7.0	8.24	29	22	7.0	8.23	29	22	7.0	8.26	29	22	7.0	8.26	30
8	21	7.2	8.07	28	21	7.2	8.22	28	21	7.2	8.23	29	21	7.2	8.30	29	21	7.3	8.21	29
9	21	5.9	8.31	29	21	6.0	8.33	30	21	6.1	8.32	29	21	6.0	8.33	29	21	6.1	8.34	28
10	21	6.0	8.39	30	21	6.1	8.39	30	21	6.1	8.35	30	21	6.1	8.36	29	21	6.3	8.34	29

**C-3-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.7	8.00	28.3	22	6.8	8.01	28	22	6.8	7.97	28	22	6.8	7.98	28	22	6.9	7.66	28
1	22	6.5	7.95	29	22	6.6	7.96	31	22	6.6	7.97	31	22	6.7	7.95	31	22	6.4	7.95	31
2	22	7.0	8.10	28	22	7.1	8.03	29	22	7.1	7.97	28	22	7.1	7.97	29	22	7.0	7.99	29
3	22	7.2	8.09	29	22	7.2	8.02	28	22	7.3	8.01	28	22	7.3	7.99	28	22	7.1	7.99	28
4	22	6.7	8.07	30	22	6.6	8.05	29	22	6.4	8.15	29	22	6.5	8.19	29	22	6.6	8.16	30
5	22	6.7	8.07	29	22	6.7	7.92	30	22	6.7	7.98	30	22	6.7	8.02	30	22	6.8	8.01	30
6	22	6.9	8.10	29	22	6.9	7.97	29	22	6.9	7.87	29	22	7.0	7.93	29	22	7.1	7.93	30
7	22	6.8	7.94	29	22	6.9	7.80	28	22	6.9	7.79	28	22	7.0	7.79	28	22	7.0	7.82	28
8	21	7.2	7.16	29	21	7.7	7.68	28	21	7.1	7.71	29	21	7.2	7.84	29	21	7.1	7.85	29
9	21	5.9	8.15	29	21	5.9	8.01	29	21	5.7	7.91	30	21	6.0	7.90	30	21	5.8	7.95	30
10	21	5.8	8.16	29	21	6.1	8.03	29	21	5.5	8.01	30	21	5.6	8.01	30	21	5.9	8.03	29

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#### D-1-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.1	7.66	30	22	6.1	7.90	30	22	6.6	7.92	30	22	6.8	7.86	30	22	6.8	7.83	30
1	22	5.9	7.92	33	22	6.0	7.90	33	22	6.2	7.95	33	22	6.6	7.94	33	22	6.5	7.91	33
2	22	6.9	7.98	29	22	7.0	7.97	28	22	7.0	7.94	30	22	7.0	7.93	30	22	7.0	7.88	29
3	22	7.1	7.97	29	22	7.2	7.87	29	22	7.3	7.86	29	22	7.1	7.87	28	22	7.2	7.83	29
4	22	6.7	8.06	29	22	7.0	7.93	29	22	6.9	7.91	30	22	6.6	7.96	29	22	6.8	7.97	29
5	22	6.7	7.95	30	22	6.8	7.91	30	22	6.8	7.90	30	22	6.8	7.81	30	22	6.8	7.80	30
6	22	6.9	7.89	29	22	7.0	7.80	28	22	7.1	7.79	29	22	7.1	7.80	29	22	7.1	7.77	28
7	22	7.0	7.70	29	22	7.0	7.70	28	22	7.1	7.71	29	22	7.0	7.70	29	22	7.0	7.59	29
8	21	7.3	7.54	29	21	7.3	7.71	29	21	7.3	7.70	29	21	7.3	7.61	30	21	7.3	7.75	31
9	21	6.2	7.88	28	21	6.3	7.86	29	21	6.4	7.82	29	21	6.2	7.79	29	21	6.2	7.82	30
10	21	6.0	7.87	29	21	6.0	7.89	29	21	6.3	7.88	29	21	6.3	7.81	29	21	6.2	7.83	30

#### D-2-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	8.00	28	22	6.6	8.03	28	22	6.6	7.78	28	22	6.5	8.03	28	22	6.6	8.02	28
1	22	6.4	7.91	30	22	6.4	7.97	30	22	6.5	8.00	30	22	6.2	8.01	30	22	6.1	8.00	30
2	22	6.8	8.12	30	22	7.0	8.12	29	22	7.1	8.13	30	22	7.0	8.11	29	22	7.0	8.09	29
3	22	7.4	8.06	28	22	7.4	8.12	28	22	7.3	8.14	28	22	7.3	8.12	28	22	7.1	8.09	28
4	22	6.9	7.91	30	22	6.8	7.90	29	22	6.8	7.88	30	22	6.9	7.86	30	22	6.9	7.81	30
5	22	6.8	8.31	30	22	6.8	8.26	30	22	6.8	8.25	30	22	6.8	8.20	30	22	6.3	7.96	30
6	22	6.9	8.18	28	22	7.0	8.23	28	22	7.1	8.23	29	22	7.1	8.19	28	22	7.1	8.09	30
7	22	6.9	8.20	28	22	7.0	8.21	28	22	7.0	8.19	29	22	7.0	8.19	28	22	6.9	8.05	30
8	21	7.4	8.13	28	21	7.3	8.17	30	21	7.2	8.15	30	21	7.1	8.13	30	21	7.1	8.08	32
9	21	6.8	8.23	30	21	6.5	8.26	30	21	6.6	8.25	29	21	6.5	8.17	29	21	6.4	8.16	30
10	21	6.1	8.29	30	21	6.2	8.28	30	21	6.3	8.26	30	21	6.4	8.23	29	21	6.2	8.18	30



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**D-3-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.7	8.03	29	22	6.7	8.06	29	22	6.8	8.02	29	22	6.8	7.96	29	22	6.7	8.00	29
1	22	6.5	7.97	30	22	6.5	7.99	30	22	6.4	7.99	30	22	6.3	8.01	30	22	6.2	7.96	30
2	22	6.6	8.08	30	22	6.8	8.05	29	22	6.9	8.03	30	22	6.9	8.06	29	22	6.9	8.05	30
3	22	7.3	8.05	28	22	7.4	8.08	28	22	7.4	8.07	28	22	7.4	8.07	28	22	7.5	8.01	29
4	22	7.0	8.15	29	22	7.0	8.17	29	22	6.9	8.15	29	22	6.9	8.14	28	22	6.8	8.06	29
5	22	6.6	8.08	30	22	6.7	8.11	30	22	6.8	8.17	30	22	6.8	8.01	30	22	6.7	8.05	30
6	22	7.0	8.09	29	22	7.0	8.09	30	22	7.1	8.14	29	22	7.0	8.01	29	22	7.0	7.98	30
7	22	6.8	8.08	30	22	6.9	8.03	29	22	6.9	8.08	30	22	6.9	7.93	30	22	6.9	7.87	29
8	21	7.4	8.04	30	21	7.3	7.93	30	21	7.2	8.12	30	21	7.2	7.99	30	21	7.3	7.96	31
9	21	6.0	8.23	29	21	5.9	8.06	30	21	6.0	8.24	29	21	5.8	8.16	30	21	5.7	8.10	29
10	21	6.2	8.22	29	21	6.1	8.11	30	21	6.0	8.26	29	21	6.0	8.15	30	21	5.9	8.13	29

**D-4-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	8.04	29	22	6.6	8.01	29	22	6.6	7.98	29	22	6.6	7.97	29	22	6.5	7.97	29
1	22	6.1	8.05	30	22	6.5	8.07	30	22	5.9	8.07	30	22	6.3	8.05	30	22	6.1	8.08	30
2	22	6.5	8.25	30	22	6.7	8.25	29	22	6.8	8.24	29	22	6.8	8.23	29	22	6.9	8.23	30
3	22	7.3	8.30	28	22	7.3	8.31	28	22	7.4	8.31	28	22	7.5	8.31	27	22	7.4	8.31	29
4	22	6.9	8.33	30	22	6.4	8.34	31	22	6.6	8.34	30	22	6.8	8.35	30	22	6.8	8.37	30
5	22	6.7	8.44	30	22	6.7	8.43	30	22	6.6	8.40	30	22	6.6	8.43	30	22	6.6	8.48	30
6	22	6.8	8.42	30	22	6.8	8.41	29	22	6.9	8.40	30	22	7.0	8.40	28	22	7.0	8.43	30
7	22	6.7	8.36	29	22	6.8	8.37	28	22	6.8	8.35	29	22	6.8	8.40	28	22	6.8	8.41	30
8	21	7.3	8.33	30	21	7.3	8.35	30	21	7.3	8.34	30	21	7.3	8.43	30	21	7.2	8.45	31
9	21	6.0	8.42	29	21	6.2	8.48	29	21	6.1	8.48	30	21	6.2	8.53	30	21	6.0	8.54	30
10	21	5.6	8.44	29	21	5.8	8.50	29	21	6.0	8.47	29	21	6.0	8.54	30	21	6.1	8.54	30

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D-5-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.5	7.85	29	22	6.5	7.96	29	22	6.6	7.87	29	22	6.6	7.88	29	22	6.5	7.97	29
1	22	6.2	8.02	30	22	6.1	7.98	30	22	6.4	7.99	30	22	6.3	8.00	30	22	6.3	7.98	30
2	22	6.6	8.17	29	22	6.7	8.16	29	22	6.8	8.09	27	22	6.8	8.09	30	22	6.8	8.08	30
3	22	7.3	8.18	28	22	7.4	8.17	29	22	7.4	8.18	28	22	7.3	8.15	28	22	7.3	8.09	29
4	22	6.8	8.31	29	22	6.8	8.27	29	22	6.8	8.25	29	22	6.6	8.21	28	22	6.4	8.15	29
5	22	6.5	8.36	30	22	6.5	8.29	30	22	6.6	8.31	30	22	6.6	8.29	30	22	6.6	8.36	30
6	22	6.7	8.31	29	22	6.9	8.23	30	22	7.0	8.24	29	22	7.0	8.25	29	22	6.9	8.23	30
7	22	6.8	8.22	29	22	6.8	8.15	29	22	6.9	8.15	29	22	6.8	8.17	28	22	6.8	8.15	30
8	21	7.4	8.09	29	21	7.3	8.11	31	21	7.4	8.12	30	21	7.3	8.11	33	21	7.2	8.14	31
9	21	6.0	8.39	28	21	6.0	8.25	29	21	5.8	8.24	29	21	6.0	8.21	30	21	6.2	8.20	31
10	21	5.8	8.30	28	21	5.9	8.27	28	21	6.0	8.26	28	21	6.0	8.22	29	21	6.1	8.21	29

D-6-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	8.04	29	22	6.5	8.01	29	22	6.8	8.02	29	22	6.8	8.00	29	22	6.8	7.96	29
1	22	6.1	7.93	31	22	6.1	8.00	31	22	6.4	7.95	31	22	6.3	8.02	31	22	6.2	8.03	31
2	22	6.4	8.07	30	22	6.6	8.08	30	22	6.9	8.11	30	22	6.9	8.11	30	22	7.1	8.13	30
3	22	7.3	8.04	28	22	7.4	8.11	28	22	7.4	8.12	29	22	7.4	8.13	28	22	7.4	8.08	30
4	22	6.4	8.08	30	22	6.5	8.12	29	22	6.4	8.15	29	22	6.6	8.17	29	22	6.8	8.15	29
5	22	6.1	8.13	30	22	6.5	8.18	30	22	6.6	8.20	30	22	6.6	8.21	30	22	6.6	8.25	30
6	22	6.5	8.10	29	22	6.8	8.10	30	22	6.9	8.19	30	22	6.9	8.19	30	22	7.0	8.18	30
7	22	6.6	7.99	27	22	6.7	7.99	28	22	6.9	8.15	28	22	6.8	8.16	28	22	6.8	8.13	30
8	21	7.3	8.06	29	21	7.4	8.00	31	21	7.2	8.25	30	21	7.4	8.30	31	21	7.3	8.27	31
9	21	6.3	8.15	30	21	6.5	8.16	31	21	6.2	8.46	32	21	6.3	8.26	31	21	6.4	8.56	30
10	21	5.7	8.20	30	21	5.9	8.26	30	21	6.0	8.47	30	21	6.0	8.60	30	21	6.2	8.63	30

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D-6-SED-FD

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.7	8.04	28	22	6.7	8.00	28	22	6.8	8.03	28	22	6.8	7.99	28	22	6.8	7.96	28
1	22	6.4	7.98	29	22	6.3	7.98	29	22	6.4	8.02	29	22	6.4	8.04	29	22	6.4	8.04	29
2	22	6.5	7.97	29	22	6.7	7.98	29	22	7.0	8.02	30	22	6.9	8.05	30	22	7.1	8.05	30
3	22	7.2	8.06	26	22	7.4	8.04	28	22	7.4	8.03	28	22	7.4	8.03	28	22	7.5	8.02	29
4	22	7.0	7.94	30	22	7.2	7.99	29	22	6.8	7.98	30	22	6.8	7.99	30	22	6.5	7.92	29
5	22	6.4	7.89	30	22	6.8	8.00	30	22	6.9	8.02	30	22	6.8	8.02	30	22	6.9	8.01	30
6	22	6.8	7.93	28	22	6.8	8.00	28	22	6.9	8.00	29	22	7.0	8.00	28	22	7.0	7.95	29
7	22	6.7	7.96	28	22	6.8	7.86	28	22	6.9	7.86	29	22	7.0	7.92	30	22	6.9	7.92	30
8	21	7.1	7.73	30	21	7.3	7.90	28	21	7.3	7.92	30	21	7.4	7.92	30	21	7.4	7.88	31
9	21	5.8	8.13	29	21	6.0	8.08	29	21	6.1	8.06	30	21	6.0	8.05	29	21	6.2	8.04	30
10	21	6.1	8.11	29	21	5.8	8.04	29	21	6.0	8.06	30	21	6.1	8.05	29	21	6.2	8.06	29

E-1-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.7	7.42	27	22	6.8	7.09	27	22	6.8	7.90	27	22	6.7	7.26	27	22	6.8	7.51	27
1	22	6.3	7.87	29	22	6.4	7.65	29	22	6.4	7.62	29	22	6.5	7.58	29	22	6.6	7.58	29
2	22	7.0	8.02	30	22	7.1	7.53	26	22	7.2	7.51	27	22	7.1	7.52	27	22	7.1	7.54	28
3	22	7.3	7.96	26	22	7.4	7.46	26	22	7.5	7.44	26	22	7.5	7.46	26	22	7.5	7.44	26
4	22	6.4	7.74	26	22	6.2	7.54	27	22	6.3	7.49	26	22	6.4	7.48	26	22	6.5	7.44	26
5	22	6.5	7.42	30	22	6.8	7.25	30	22	6.9	7.37	30	22	6.8	6.93	30	22	6.8	7.40	30
6	22	6.2	7.23	27	22	6.7	7.23	27	22	6.9	7.33	27	22	6.7	7.34	27	22	6.8	7.32	27
7	22	6.7	7.53	27	22	6.8	7.47	26	22	6.9	7.36	27	22	6.7	7.34	27	22	6.9	7.32	27
8	21	7.0	6.29	26	21	7.2	6.54	27	21	7.4	6.85	27	21	7.3	6.76	28	21	7.3	6.88	28
9	21	6.0	7.68	27	21	6.0	7.49	27	21	6.0	7.43	27	21	6.3	7.38	27	21	6.2	7.36	28
10	21	5.7	7.42	28	21	6.1	7.33	28	21	6.2	7.21	27	21	5.9	7.17	27	21	5.9	7.23	28

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E-2-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	2.3	6.52	28	22	3.1	6.52	28	22	3.4	6.50	28	22	3.7	6.51	28	22	3.6	6.50	28
1	22	7.0	7.58	30	22	7.3	7.54	30	22	7.6	7.64	30	22	7.5	7.65	30	22	7.2	7.56	30
2	22	6.7	7.56	27	22	7.0	7.54	26	22	7.1	7.49	26	22	7.0	7.45	26	22	7.0	7.43	26
3	22	7.4	7.44	26	22	7.5	7.31	26	22	7.5	7.29	26	22	7.5	7.27	26	22	7.5	7.24	26
4	22	6.8	7.40	26	22	6.7	7.37	25	22	6.8	7.32	26	22	6.6	7.32	25	22	6.5	7.28	25
5	22	6.9	7.07	30	22	6.9	6.95	30	22	6.9	6.96	30	22	6.9	7.01	30	22	6.9	7.07	30
6	22	6.7	7.39	27	22	6.9	7.42	27	22	7.0	7.43	27	22	6.8	7.44	26	22	6.9	7.43	26
7	22	6.9	7.35	27	22	6.9	7.34	27	22	6.9	7.31	27	22	6.9	7.29	26	22	6.8	7.28	27
8	21	7.6	6.88	27	21	7.3	6.93	29	21	7.4	6.93	27	21	7.5	6.69	27	21	7.4	6.63	28
9	21	6.7	7.41	27	21	6.6	7.41	28	21	6.3	7.40	27	21	6.4	7.41	27	21	6.2	7.39	27
10	21	6.4	7.33	27	21	6.3	7.36	27	21	6.4	7.37	28	21	6.4	7.41	28	21	6.4	7.40	28

E-3-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.4	7.47	27	22	6.5	7.53	27	22	6.7	7.40	27	22	6.8	7.41	27	22	6.7	7.37	27
1	22	6.4	7.55	29	22	6.3	7.57	29	22	6.5	7.57	29	22	7.0	7.56	29	22	6.8	7.51	29
2	22	6.9	7.44	27	22	7.1	7.47	27	22	7.1	7.50	28	22	7.1	7.51	28	22	7.1	7.50	28
3	22	7.6	7.21	26	22	7.5	7.46	26	22	7.5	7.47	26	22	7.3	7.47	26	22	7.4	7.45	26
4	22	6.6	7.28	25	22	6.4	7.30	26	22	6.5	7.31	26	22	6.5	7.24	26	22	6.5	7.22	25
5	22	6.9	7.26	30	22	6.9	7.25	30	22	6.9	7.29	30	22	6.9	6.96	30	22	6.7	6.99	30
6	22	7.0	7.56	28	22	7.0	7.56	28	22	7.1	7.57	27	22	6.9	7.56	27	22	6.9	7.48	28
7	22	6.7	7.27	30	22	6.9	7.46	28	22	7.0	7.46	27	22	6.9	7.27	26	22	6.8	7.56	27
8	21	7.5	7.25	28	21	7.4	7.23	29	21	7.4	7.19	28	21	7.4	6.94	28	21	7.3	7.15	30
9	21	5.8	7.35	29	21	5.9	7.34	28	21	5.7	7.35	29	21	5.8	7.35	28	21	5.9	7.28	29
10	21	5.9	7.33	29	21	6.1	7.31	29	21	6.1	7.38	29	21	6.1	7.37	28	21	6.0	7.29	29

CLIENT: SAIC  
 STUDY NUMBER: 7814  
 PROJECT: RAYMARK 1999  
 PARAMETER: Water Quality Data

E-4-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.8	4.29	27	22	6.9	3.71	27	22	6.9	3.90	27	22	6.9	4.41	27	22	6.9	4.38	27
1	22	6.4	7.37	29	22	6.8	7.16	29	22	6.7	6.74	29	22	6.6	6.75	29	22	6.7	6.75	29
2	22	6.8	6.84	28	22	7.0	5.51	27	22	7.1	5.04	27	22	7.0	5.51	29	22	7.1	5.38	28
3	22	7.5	7.25	27	22	7.5	7.23	26	22	7.5	7.20	27	22	7.5	7.16	28	22	7.4	7.17	28
4	22	6.6	7.17	27	22	6.5	7.14	26	22	6.8	7.11	27	22	6.6	7.12	28	22	6.7	7.14	27
5	22	6.8	6.75	30	22	6.9	5.89	30	22	7.0	6.53	30	22	7.0	6.99	30	22	6.9	6.85	30
6	22	6.9	7.47	27	22	7.1	6.86	27	22	7.1	7.10	28	22	7.1	7.26	28	22	7.0	7.27	28
7	22	6.9	7.26	27	22	7.0	6.48	26	22	7.0	6.48	28	22	6.9	6.89	27	22	6.9	6.90	27
8	21	7.6	6.36	27	21	7.5	6.06	27	21	7.5	6.44	28	21	7.5	6.93	28	21	7.5	6.60	29
9	21	5.8	7.22	27	21	5.7	6.99	26	21	5.9	6.97	27	21	5.9	7.02	26	21	5.8	7.05	29
10	21	6.1	7.28	27	21	6.1	7.17	27	21	5.9	7.16	27	21	5.8	7.25	27	21	5.7	7.28	28

F-1-SED-SMP

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.9	7.99	29	22	6.9	8.00	29	22	6.9	7.95	29	22	6.9	8.00	29	22	6.8	7.90	29
1	22	7.1	7.74	31	22	6.9	7.91	31	22	6.8	7.98	31	22	7.0	8.04	31	22	6.9	8.04	31
2	22	6.8	7.78	30	22	7.0	8.03	30	22	7.0	8.05	30	22	7.0	8.06	29	22	7.1	8.07	29
3	22	7.3	8.14	28	22	7.4	8.16	29	22	7.5	8.17	29	22	7.4	8.17	29	22	7.4	8.16	29
4	22	6.8	8.14	28	22	6.7	8.29	28	22	6.7	8.32	28	22	6.8	8.27	28	22	6.6	8.26	28
5	22	6.8	8.43	30	22	6.8	8.58	30	22	6.7	8.51	30	22	6.8	8.44	30	22	6.8	8.42	30
6	22	6.9	8.43	29	22	7.0	8.58	29	22	7.0	8.58	29	22	7.0	8.47	30	22	6.9	8.46	29
7	22	6.8	8.46	29	22	6.9	8.49	29	22	6.9	8.48	29	22	6.9	8.47	30	22	6.9	8.46	29
8	21	7.5	8.40	29	21	7.5	8.33	30	21	7.5	8.36	30	21	7.5	8.38	31	21	7.5	8.48	30
9	21	5.9	8.45	29	21	6.1	8.44	30	21	6.3	8.44	29	21	5.9	8.45	30	21	6.0	8.52	30
10	21	6.1	8.33	29	21	6.1	8.33	29	21	6.1	8.38	29	21	6.3	8.38	29	21	6.2	8.45	30

CLIENT: SAIC  
 STUDY NUMBER: 7814  
 PROJECT: RAYMARK 1999  
 PARAMETER: Water Quality Data

**F-2-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	8.01	29	22	6.6	7.99	29	22	6.7	7.98	29	22	6.7	7.98	29	22	6.8	7.96	29
1	22	6.4	8.03	31	22	6.6	8.04	31	22	6.6	8.06	31	22	6.4	8.07	31	22	6.9	8.04	31
2	22	6.7	8.10	29	22	6.9	8.10	30	22	7.0	8.11	30	22	7.0	8.10	30	22	6.9	8.08	30
3	22	7.4	8.13	29	22	7.5	8.11	28	22	7.4	8.10	29	22	7.4	8.08	29	22	7.5	8.08	29
4	22	6.8	8.10	27	22	6.9	8.08	27	22	6.6	8.07	28	22	6.9	8.06	28	22	6.7	8.06	27
5	22	6.8	8.14	30	22	6.8	8.12	30	22	6.8	8.09	30	22	6.8	8.12	30	22	6.8	8.10	30
6	22	7.1	8.16	29	22	7.1	8.11	29	22	7.1	8.10	29	22	7.2	8.08	29	22	7.0	8.06	30
7	22	6.9	8.09	28	22	7.0	8.00	28	22	6.7	7.86	28	22	6.8	7.92	29	22	6.8	7.92	28
8	21	7.5	7.65	28	21	7.5	7.96	30	21	7.4	7.86	29	21	7.4	7.97	31	21	7.5	7.92	30
9	21	6.2	8.27	28	21	6.3	8.18	30	21	6.1	8.02	28	21	6.3	8.06	30	21	6.3	8.08	29
10	21	5.9	8.18	28	21	6.1	8.08	29	21	6.3	7.97	29	21	6.2	8.04	29	21	6.4	8.04	28

**F-3-SED-SMP**

Day	Replicate A				Replicate B				Replicate C				Replicate D				Replicate E			
	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal	Temp	D.O.	pH	Sal
0	22	6.6	8.04	28	22	6.5	8.00	28	22	6.5	8.08	28	22	6.5	8.03	28	22	6.5	8.08	28
1	22	6.5	8.06	30	22	6.6	8.07	30	22	6.3	8.10	30	22	6.2	8.08	30	22	6.3	8.10	30
2	22	6.6	8.11	29	22	6.8	8.16	30	22	7.0	8.18	30	22	7.0	8.17	30	22	7.0	8.15	29
3	22	7.3	8.08	28	22	7.4	8.12	28	22	7.5	8.14	28	22	7.4	8.15	28	22	7.4	8.15	28
4	22	6.6	8.11	29	22	6.8	8.12	30	22	6.6	8.12	29	22	6.6	8.12	28	22	6.8	8.13	28
5	22	6.8	8.18	30	22	6.7	8.18	30	22	6.8	8.18	30	22	6.9	8.17	30	22	6.8	8.17	30
6	22	7.1	8.18	29	22	7.1	8.18	29	22	7.1	8.17	29	22	7.1	8.16	28	22	7.1	8.16	28
7	22	6.8	8.15	27	22	7.0	8.14	28	22	7.0	8.13	28	22	6.9	8.12	28	22	6.9	8.09	28
8	21	7.4	7.99	29	21	7.4	8.19	29	21	7.4	8.18	29	21	7.5	8.09	29	21	7.5	8.09	29
9	21	6.1	8.34	28	21	6.3	8.42	28	21	6.2	8.41	29	21	6.3	8.26	29	21	6.1	8.21	29
10	21	5.9	8.33	28	21	6.1	8.29	28	21	6.3	8.31	29	21	6.3	8.31	29	21	6.3	8.16	28

***Ampelisca abdita* CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7314				SAMPLE ID: Control				DILUENT: Hampton Estuary				START DATE:			
DAY	REP A				REP B				REP C				INITIALS		
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.			
0	22	6.6	7.93	30	22	6.8	7.94	30	22	6.9	7.96	30	JR		
1	22	6.4	7.77	32	22	6.7	7.92	32	22	6.8	7.86	32	WL		
2	22	7.2	7.92	29	22	7.2	7.94	30	22	7.1	7.98	30	—		
3	22	7.5	7.98	29	22	7.5	7.98	28	22	7.6	7.97	29	—		
4	22	7.0	7.87	31	22	6.8	7.89	31	22	6.8	7.90	30	WL		
5	22	7.0	8.07	30	22	6.9	8.00	30	22	6.8	7.99	30	KRB		
6	22	7.1	7.98	30	22	7.1	7.97	30	22	7.1	7.96	30	—		
7	22	7.1 5.9	7.87	30	22	7.1 6.0	7.86	30	22	7.1 5.9	7.86	30	—		
8	21	7.2	7.90	29	21	7.2	6.92	29	21	7.2	6.87	28	CV		
9	21	5.9	8.03	30	21	5.9	8.14	30	21	6.1	8.06	29	WL		
10	21	6.5	8.10	30	21	6.4	8.19	30	21	6.4	8.17	30	CE		
# ALIVE	18				20				10 <sup>2</sup> 18				14		

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.9	7.95	30	22	6.9	7.95	30	22	///	///	///	///
1	22	6.8	7.86	32	22	6.8	7.77	32					
2	22	7.0	7.98	30	22	6.9	7.95	30					
3	22	7.5	7.94	28	22	7.6	7.95	29					
4	22	6.8	7.83	31	22	6.7	7.88	31					
5	22	6.7	8.03	30	22	6.8	8.09	30	KRB	///	///	///	///
6	22	7.1	7.95	30	22	7.1	7.96	30					
7	22	7.1	7.86	30	22	7.1	7.91	30					
8	21	7.2	7.08	29	21	7.1	7.96	31					
9	21	6.1	8.07	28	21	6.3	8.07	29					
10	21	6.4	8.17	30	21	6.3	8.14	30	21	///	///	///	///
# ALIVE	16				10								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

# Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY

STUDY # 7814-1					SAMPLE ID: C-1-SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	22	6.8	8.01	29	22	6.8	8.01	29	22	6.8	7.99	29	EL
1	22	6.6	7.99	31	22	6.4	8.01	31	22	6.4	8.01	31	UL
2	22	6.8	8.00	30	22	7.0	8.10	29	22	6.9	8.10	29	—
3	22	7.4	8.12	29	22	7.4	8.12	27	22	7.4	8.12	27	—
4	22	6.8	8.12	31	22	6.9	8.16	31	22	6.6	8.15	30	UL
5	22	6.8	8.37	30	22	6.8	8.37	30	22	6.7	8.30	30	XRB
6	22	6.9	8.31	30	22	7.1	8.32	30	22	7.1	8.31	30	—
7	22	5.9	8.18	30	22	5.9	8.29	30	22	5.9	8.28	30	—
8	21	7.1	8.06	28	21	7.0	8.32	28	21	7.3	8.20	27	CL
9	21	6.3	8.41	28	21	6.2	8.42	30	21	6.3	8.42	29	UL
10	21	6.3	8.48	29	21	6.1	8.46	29	21	6.0	8.48	29	CL
# ALIVE	13				13				9				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.7	8.00	29	22	6.7	8.02	29	8	14	11	11	11
1	22	6.4	8.11	31	22	6.3	8.01	31					
2	22	6.9	8.10	28	22	6.9	8.09	28					
3	22	7.3	8.11	27	22	7.4	8.10	27					
4	22	6.8	8.14	31	22	6.7	8.15	30					
5	22	6.7	8.35	30	22	6.7	8.35	30	XRB				
6	22	6.5	8.18	30	22	6.9	8.28	30					
7	22	5.8	8.25	29	22	5.8	8.25	30					
8	21	7.2	8.32	30	21	7.1	8.34	30					
9	21	6.1	8.44	29	21	6.3	8.42	30					
10	21	6.2	8.47	29	21	6.1	8.47	30	CL				
# ALIVE	5				9								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.



**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7814 -2		SAMPLE ID: C-2-SED-SMP				DILUENT: Hampton Estuary				START DATE:			
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	22	6.7	8.02	28	22	6.8	8.04	28	22	6.8	7.98	28	R
1	22	1.6	8.00	31	22	1.6	8.01	31	22	1.4	7.98	31	W
2	22	6.4	8.09	29	22	6.8	8.09	28	22	7.0	8.09	28	—
3	22	7.3	8.17	29	22	7.3	8.11	29	22	7.3	8.12	28	—
4	22	2.9	8.14	29	22	1.8	8.13	30	22	6.7	8.14	30	W
5	22	6.6	8.35	30	22	5.6	8.08	30	22	6.5	8.30	30	XRS
6	22	6.9	8.29	30	22	7.0	8.28	29	22	7.0	8.27	29	—
7	22	7.0	8.27	29	22	7.0	8.24	29	22	7.0	8.23	29	—
8	21	7.2	8.07	28	21	7.2	8.22	28	21	7.2	8.23	29	
9	21	5.9	8.31	29	21	6.0	8.33	30	21	6.1	8.32	29	W
10	21	6.0	8.39	30	21	6.1	8.39	30	21	6.1	8.35	30	C
# ALIVE	14				12				15				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.7	7.99	28	22	6.7	8.03	28	8				
1	22	1.5	7.99	31	22	1.5	7.97	31					
2	22	7.1	8.10	28	22	7.1	8.11	28					
3	22	7.3	8.14	28	22	7.2	8.14	28					
4	22	6.8	8.13	29	22	6.9	8.14	29					
5	22	6.6	8.32	30	22	6.6	8.24	30	XRS				
6	22	7.0	8.27	29	22	7.0	8.26	29					
7	22	7.0	8.26	29	22	7.0	8.26	30					
8	21	7.2	8.30	27	21	7.3	8.21	27					
9	21	6.0	8.33	29	21	6.1	8.34	28					
10	21	6.1	8.36	29	21	6.3	8.34	29	Cd				
# ALIVE	9				5								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY #7814-3	SAMPLE ID: C-3-SED-SMP	DILUENT: Hampton Estuary	START DATE:
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DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	22	6.7	8.00	28	22	6.8	8.01	28	22	6.8	7.97	28	R
1	22	6.5	7.95	31	22	6.6	7.96	31	22	6.6	7.97	31	
2	22	7.0	8.10	29	22	7.1	8.03	29	22	7.1	7.97	28	—
3	22	7.2	8.09	28	22	7.2	8.02	28	22	7.3	8.01	28	
4	22	6.7	8.07	29	22	6.6	8.05	29	22	6.4	8.15	29	W
5	22	6.7	8.07	30	22	6.7	7.92	30	22	6.7	7.98	30	
6	22	6.9	8.10	29	22	6.9	7.87	29	22	6.9	7.87	27	—
7	22	6.8	7.94	27	22	6.9	7.80	28	22	6.9	7.79	28	
8	21	7.2	7.16	21	21	7.4	7.68	28	21	7.1	7.71	29	En
9	21	5.9	8.15	29	21	5.9	8.01	29	21	5.7	7.91	30	
10	21	5.8	8.16	29	21	6.1	8.08	29	21	5.5	8.01	30	Ck
# ALIVE	1				3				2				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.8	7.98	28	22	6.9	7.66	28	X	///	///	///	///
1	22	6.7	7.95	31	22	6.4	7.95	31					
2	22	7.1	7.97	29	22	7.0	7.99	29					
3	22	7.3	7.99	28	22	7.1	7.99	28					
4	22	6.5	8.09	29	22	6.6	8.16	30					
5	22	6.7	8.02	30	22	6.8	8.01	30	X				
6	22	7.0	7.93	29	22	7.1	7.93	30					
7	22	7.0	7.79	28	22	7.0	7.82	28					
8	21	7.2	7.84	29	21	7.1	7.85	29					
9	21	6.0	7.90	30	21	5.8	7.95	30					
10	21	5.6	8.01	30	21	5.9	8.08	29	0.4				
# ALIVE	0				0								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7814-4		SAMPLE ID: D-1-SED-SMP				DILUENT: Hampton Estuary				START DATE:			
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	22	6.1	7.66	30	22	6.1	7.90	30	22	6.6	7.92	30	xl
1	22	5.9	7.92	33	22	6.0	7.90	33	22	6.2	7.95	33	lll
2	22	6.9	7.98	29	22	7.0	7.97	28	22	7.0	7.94	30	—
3	22	7.1	7.97	29	22	7.2	7.87	29	22	7.3	7.86	29	~
4	22	6.7	8.06	29	22	7.0	7.93	29	22	6.9	7.91	30	lll
5	22	6.7	7.95	30	22	6.8	7.91	30	22	6.8	7.90	30	XRS
6	22	6.9	7.89	29	22	7.0	7.80	28	22	7.1	7.79	29	—
7	22	7.0	7.70	29	22	7.0	7.70	28	22	7.1	7.71	29	—
8	21	7.3	7.54	29	21	7.3	7.71	29	21	7.3	7.70	27	CW
9	21	6.2	7.88	28	21	6.3	7.86	29	21	6.4	7.87	29	lll
10	21	6.0	7.87	29	21	6.0	7.84	29	21	6.3	7.80	29	C
# ALIVE	17				19				17				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.8	7.86	30	22	6.8	7.83	30	xl	lll	lll	lll	lll
1	22	6.6	7.94	33	22	6.5	7.91	33					
2	22	7.0	7.93	30	22	7.0	7.88	29					
3	22	7.1	7.87	28	22	7.2	7.83	29					
4	22	6.6	7.96	29	22	6.8	7.97	29					
5	22	6.8	7.81	30	22	6.8	7.80	30	XRS				
6	22	7.1	7.80	29	22	7.1	7.77	28					
7	22	7.0	7.70	29	22	7.0	7.59	29					
8	21	7.3	7.61	30	21	7.3	7.74	31					
9	21	6.2	7.79	29	21	6.2	7.82	30					
10	21	6.3	7.84	29	21	6.2	7.83	30	C				
# ALIVE	9				12								

- \* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY #7814-5		SAMPLE ID: D-2-SED-SMP				DILUENT: Hampton Estuary				START DATE:			
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	22	6.6	8.00	28	22	6.6	8.03	28	22	6.6	7.78	28	X
1	22	6.4	7.91	30	22	6.4	7.97	30	22	6.5	8.00	30	UH
2	22	6.8	8.12	30	22	7.0	8.12	29	22	7.1	8.13	30	—
3	22	7.4	8.06	28	22	7.4	8.12	28	22	7.3	8.14	28	—
4	22	6.9	7.91	30	22	6.8	7.90	29	22	6.8	7.88	30	UH
5	22	6.8	8.31	30	22	6.8	8.26	30	22	6.8	8.25	30	XMS
6	22	6.9	8.18	28	22	7.0	8.23	28	22	7.1	8.23	29	—
7	22	6.9	8.20	28	22	7.0	8.21	28	22	7.0	8.19	29	—
8	21	7.4	8.13	28	21	7.3	8.17	30	21	7.2	8.15	30	CW
9	21	6.8	8.23	30	21	6.5	8.26	30	21	6.6	8.25	29	UH
10	21	6.1	8.29	30	21	6.8	8.28	30	21	6.9	8.26	30	CW
# ALIVE	15				16				14				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.5	8.03	28	22	6.6	8.02	28	X	111	11	110	21
1	22	6.2	8.01	30	22	6.1	8.00	30					
2	22	7.0	8.11	29	22	7.0	8.09	29					
3	22	7.3	8.12	28	22	7.1	8.09	28					
4	22	6.9	7.80	30	22	6.9	7.81	30					
5	22	6.8	8.20	30	22	6.3	7.96	30	XMS				
6	22	7.1	8.19	28	22	7.1	8.09	30					
7	22	7.0	8.19	28	22	6.9	8.05	30					
8	21	7.1	8.13	30	21	7.1	8.08	32					
9	21	6.5	8.17	29	21	6.4	8.16	30					
10	21	6.4	8.29	29	21	6.2	8.15	30	CW				
# ALIVE	5				5								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7814 - 6					SAMPLE ID: D3-SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	
0	22	6.7	8.03	29	22	6.7	8.06	29	22	6.8	8.02	29	✓
1	22	6.5	7.77	30	22	6.5	7.79	30	22	6.4	7.79	30	UL
2	22	6.6	8.08	30	22	6.8	8.05	29	22	6.9	8.03	30	—
3	22	7.3	8.05	28	22	7.4	8.08	28	22	7.4	8.07	28	—
4	22	7.0	8.15	29	22	7.0	8.17	29	22	6.9	8.15	29	UL
5	22	6.6	8.08	30	22	6.7	8.11	30	22	6.8	8.17	30	XMB
6	22	7.0	8.09	29	22	7.0	8.09	30	22	7.1	8.14	29	—
7	22	6.8	8.08	30	22	6.9	8.03	29	22	6.9	8.08	30	—
8	21	7.4	8.09	30	21	7.3	7.93	30	21	7.2	8.12	30	CW
9	21	6.0	8.23	29	21	5.9	8.06	30	21	6.0	8.24	29	UL
10	21	6.0	8.22	29	21	6.1	8.11	30	21	6.0	8.26	29	Cf
# ALIVE	10				12				10				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	A	B	C	D	E
0	22	6.8	7.96	29	22	6.7	8.00	29	✓	✓	✓	✓	✓
1	22	6.3	7.01	30	22	6.2	7.16	31					
2	22	6.9	8.06	29	22	6.9	8.05	30					
3	22	7.4	8.07	28	22	7.5	8.01	29					
4	22	6.9	8.14	28	22	6.8	8.06	29					
5	22	6.8	8.01	30	22	6.7	8.05	30	XMB				
6	22	7.0	8.01	29	22	7.0	7.98	30					
7	22	6.9	7.93	30	22	6.9	7.87	29					
8	21	7.2	7.97	30	21	7.3	7.96	31					
9	21	5.8	8.16	30	21	5.7	8.10	29					
10	21	6.0	8.15	30	21	5.9	8.13	29	U				
# ALIVE	7				7								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

Amperiscia abdita CHRONIC EXPOSURE SEDIMENT ASSAY														
STUDY # 7814 - 2				SAMPLE ID: DH-SED-SMP				DILUENT: Hampton Estuary				START DATE:		
DAY	REP A				REP B				REP C				INITIALS	
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.		
0	22	6.6	8.04	29	22	6.6	8.01	29	22	6.6	7.98	29	XL	
1	22	6.1	8.05	30	22	6.5	8.07	30	22	5.9	8.07	30	110	
2	22	6.5	8.25	30	22	6.7	8.25	29	22	6.8	8.24	29	—	
3	22	7.3	8.30	28	22	7.3	8.31	28	22	7.4	8.31	28	—	
4	22	6.9	8.33	30	22	6.4	8.34	31	22	6.6	8.34	30	Wh	
5	22	6.7	8.44	30	22	6.7	8.43	30	22	6.6	8.40	30	XAS	
6	22	6.8	8.42	30	22	6.8	8.41	29	22	6.9	8.40	30	—	
7	22	6.7	8.36	29	22	6.8	8.37	28	22	6.8	8.35	29	—	
8	21	7.3	8.33	30	21	7.3	8.35	30	21	7.3	8.39	30	Cv	
9	21	6.0	8.42	29	21	6.2	8.48	29	21	6.1	8.48	30	Wh	
10	21	5.6	8.44	29	21	5.8	8.50	29	21	6.0	8.47	29	Cl	
# ALIVE	14				16				12				110	

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.6	7.97	29	22	6.5	7.97	29	X	110	110	110	110
1	22	6.3	8.05	30	22	6.1	8.08	30					
2	22	6.8	8.23	29	22	6.9	8.23	30					
3	22	7.5	8.31	27	22	7.4	8.31	29					
4	22	6.8	8.35	30	22	6.8	8.37	30					
5	22	6.6	8.43	30	22	6.6	8.48	30	XAS				
6	22	7.0	8.40	28	22	7.0	8.43	30					
7	22	6.8	8.40	28	22	6.8	8.41	30					
8	21	7.3	8.48	30	21	7.2	8.45	31					
9	21	6.2	8.53	30	21	6.0	8.54	30					
10	21	6.0	8.54	30	21	6.1	8.54	30	Cv				
# ALIVE	11				4								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

# *Ampeisca abdita* CHRONIC EXPOSURE SEDIMENT ASSAY

STUDY # 7814-8					SAMPLE ID: 0-5.SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	
0	22	6.5	7.95	29	22	6.5	7.96	29	22	6.6	7.87	29	JC
1	22	6.2	8.02	30	22	6.4	7.98	31	22	6.4	7.79	30	LL
2	22	6.6	8.17	29	22	6.7	8.16	29	22	6.8	8.09	27	—
3	22	7.3	8.18	28	22	7.4	8.17	29	22	7.4	8.18	28	—
4	22	6.8	8.31	29	22	6.8	8.27	29	22	6.8	8.25	29	LL
5	22	6.5	8.36	30	22	6.5	8.29	30	22	6.6	8.31	30	XMS
6	22	6.7	8.31	29	22	6.9	8.23	30	22	7.0	8.24	29	—
7	22	6.8	8.22	29	22	6.8	8.15	29	22	6.9	8.15	29	—
8	21	7.4	8.09	29	21	7.3	8.11	31	21	7.4	8.12	30	CL
9	21	6.0	8.39	28	21	6.0	8.25	29	21	5.8	8.24	29	LL
10	21	5.8	8.30	28	21	5.9	8.27	28	21	6.0	8.26	28	CL
# ALIVE	12				17				10				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	A	B	C	D	E
0	22	6.6	7.88	29	22	6.5	7.97	29	X	///	///	///	///
1	22	6.3	8.00	30	22	6.3	7.98	30					
2	22	6.8	8.09	30	22	6.8	8.08	30					
3	22	7.3	8.15	28	22	7.3	8.09	29					
4	22	6.6	8.21	28	22	6.4	8.15	29					
5	22	6.6	8.29	30	22	6.6	8.36	30	XMS				
6	22	7.0	8.25	29	22	6.9	8.23	30					
7	22	6.8	8.17	28	22	6.8	8.15	30					
8	21	7.3	8.11	33	21	7.2	8.14	31					
9	21	6.0	8.21	30	21	6.2	8.20	31					
10	21	6.0	8.22	29	21	6.1	8.21	29	CL				
# ALIVE	12				12								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

# AMPHIPHILIC ADULT CHRONIC EXPOSURE SEDIMENT ASSAY

STUDY # 7814-9					SAMPLE ID:				DILUENT: Hampton Estuary		START DATE:		
					D-6-SEP-SMP								
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	21	6.6	8.04	29	21	6.5	8.01	29	21	6.8	8.02	29	X
1	22	6.1	7.93	31	22	6.1	8.10	31	22	6.4	7.95	31	UL
2	22	6.4	8.07	30	22	6.6	8.08	30	22	6.9	8.11	30	-
3	22	7.3	8.04	28	22	7.4	8.11	28	22	7.4	8.12	29	-
4	22	6.4	8.18	30	22	6.5	8.12	29	22	6.4	8.15	29	UL
5	22	6.1	8.13	30	22	6.5	8.18	30	22	6.6	8.20	30	XRS
6	22	6.5	8.10	29	22	6.8	8.10	30	22	6.9	8.19	30	-
7	22	6.6	7.99	27	22	6.7	7.99	28	22	6.9	8.15	28	-
8	21	7.3	8.06	29	21	7.4	8.00	31	21	7.2	8.25	30	CU
9	21	5.5	8.15	30	21	6.5	8.11	31	21	6.2	8.46	30	UL
10	21	5.7	8.20	30	21	5.9	8.26	30	21	6.0	8.47	30	CU
# ALIVE	0				3				0				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	22	6.8	8.00	29	21	6.8	7.96	29	X	///	///	///	///
1	22	6.3	8.02	31	22	6.2	8.03	31					
2	22	6.9	8.11	30	22	7.1	8.13	30					
3	22	7.4	8.13	28	22	7.4	8.08	30					
4	22	UL	8.17	29	22	7.8	8.15	29					
5	22	6.6	8.21	30	22	6.6	8.25	30	XRS				
6	22	6.9	8.19	30	22	7.0	8.18	30					
7	22	6.8	8.16	28	22	6.8	8.13	30					
8	21	7.4	8.10	31	21	7.3	8.27	71					
9	21	6.3	8.07	31	21	6.4	8.06	30					
10	21	6.0	8.60	30	21	6.8	8.63	30	CU				
# ALIVE	0				0								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.



# *Ampelisca abdita* CHRONIC EXPOSURE SEDIMENT ASSAY

STUDY # 7814-10					SAMPLE ID:				DILUENT: Hampton Estuary		START DATE:		
					56-SED-FD								
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	
0	21	6.7	8.04	28	21	6.7	8.00	28	21	6.8	8.03	28	2
1	22	6.4	7.98	29	22	6.2	7.98	29	22	6.4	8.02	29	1cl
2	22	6.5	7.97	29	22	6.7	7.98	29	22	7.0	8.02	30	
3	22	7.2	8.06	26	22	7.4	8.04	28	22	7.4	8.03	28	~
4	22	7.0	7.94	30	22	7.2	7.99	29	22	6.8	7.98	30	W
5	22	6.4	7.89	30	22	6.8	8.00	30	22	6.9	8.02	30	WFS
6	22	6.8	7.93	28	22	6.8	8.00	28	22	6.9	8.00	29	-
7	22	6.7	7.96	28	22	6.8	7.86	28	22	6.9	7.86	29	-
8	21	7.1	7.73	30	21	7.3	7.70	28	21	7.3	7.92	30	
9	21	5.8	8.13	29	21	6.0	8.15	29	21	6.1	8.06	30	W
10	21	6.1	8.11	29	21	5.8	8.04	29	21	6.0	8.06	30	cl
# ALIVE	0				0				0				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	A	B	C	D	E
0	21	6.8	7.99	28	22	6.8	7.96	28	2	11	111	111	111
1	22	6.4	8.04	29	22	6.4	8.04	29					
2	22	6.9	8.05	30	22	7.1	8.05	30					
3	22	7.4	8.03	28	22	7.5	8.02	29					
4	22	6.8	7.99	30	22	6.5	7.92	29					
5	22	6.8	8.02	30	22	6.9	8.01	30	WFS	111	111	111	111
6	22	7.0	8.00	28	22	7.0	7.95	29					
7	22	7.0	7.92	30	22	6.9	7.92	30					
8	21	7.4	7.92	30	21	7.4	7.88	31					
9	21	6.0	8.15	29	21	6.2	8.04	30					
10	21	6.1	8.05	29	21	6.2	8.06	29	cl				
# ALIVE	0				0								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

# Amperisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY

STUDY # 7814 - 11					SAMPLE ID: E-1-SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	
0	21	6.7	7.42	27	21	6.8	7.09	27	21	6.8	7.29	27	SL
1	22	6.3	7.87	27	22	6.4	7.65	27	22	6.4	7.62	27	il
2	22	7.0	8.02	30	22	7.1	7.53	26	22	7.2	7.51	27	—
3	22	7.3	7.96	26	22	7.4	7.46	26	22	7.5	7.44	26	—
4	22	6.4	7.74	26	22	6.2	7.57	27	22	6.3	7.49	26	il
5	22	6.5	7.42	30	22	6.8	7.25	30	22	6.9	7.37	30	XFS
6	22	6.2	7.23	27	22	6.7	7.23	27	22	6.9	7.33	27	—
7	22	6.7	7.53	27	22	6.8	7.47	26	22	6.9	7.36	27	—
8	21	7.0	6.29	26	21	7.2	6.54	27	21	7.4	6.85	27	
9	21	6.0	7.68	27	21	6.0	7.49	27	21	6.0	7.43	27	il
10	21	5.7	7.42	28	21	6.1	7.33	28	21	6.2	7.21	27	CL
# ALIVE	11				14				15				

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	A	B	C	D	E
0	21	6.7	7.26	27	21	6.8	7.51	27	SL	//	//	//	//
1	22	6.5	7.58	27	22	6.6	7.58	27					
2	22	7.1	7.52	27	22	7.1	7.54	28					
3	22	7.5	7.46	26	22	7.5	7.44	26					
4	22	6.4	7.48	26	22	6.5	7.44	26					
5	22	6.8	7.6.93	30	22	6.8	7.40	30	XFS	//	//	//	//
6	22	6.7	7.34	27	22	6.8	7.32	27					
7	22	6.7	7.34	27	22	6.9	7.32	27					
8	21	7.3	6.76	28	21	7.3	6.88	28					
9	21	6.3	7.38	27	21	6.2	7.36	28					
10	21	5.9	7.17	27	21	5.9	7.03	28	CL				
# ALIVE	9				14								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

~~See Min. Dec. 1/28/11~~

# **Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7814 -12					SAMPLE ID: E-2-SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	
0	21	2.3	6.52	28	21	3.1	6.52	28	21	3.4	6.50	28	2
1	22	7.0	7.58	21	22	7.3	7.54	21	22	7.6	7.54	30	
2	22	6.7	7.56	27	22	7.0	7.54	26	22	7.1	7.49	26	-
3	22	7.4	7.44	26	22	7.5	7.31	26	22	7.5	7.29	26	-
4	22	6.8	7.47	26	22	6.7	7.37	25	22	6.8	7.32	26	12
5	22	6.9	7.07	30	22	6.9	6.95	30	22	6.9	6.96	30	7/12
6	22	6.7	7.39	27	22	6.9	7.42	27	22	7.0	7.43	27	-
7	22	6.9	7.35	27	22	6.9	7.34	27	22	6.9	7.31	27	-
8	21	7.6	6.88	27	21	7.3	6.93	27	21	7.7	6.93	27	20
9	21	6.4	7.41	27	21	6.6	7.41	28	21	6.3	7.41	27	12
10	21	6.4	7.39	27	21	6.3	7.36	27	21	6.4	7.37	28	20
# ALIVE	12				16				11				24

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL	TEMP	D.O.	pH	SAL	A	B	C	D	E
0	21	3.7	6.51	28	21	3.6	6.50	28	2	1	1	1	1
1	22	7.5	7.65	30	22	7.2	7.56	30					
2	22	7.0	7.45	26	22	7.0	7.43	26					
3	22	7.5	7.27	26	22	7.5	7.24	26					
4	22	6.6	7.32	25	22	6.5	7.28	25					
5	22	6.9	7.01	30	22	6.9	7.07	30	7/12				
6	22	6.8	7.44	26	22	6.9	7.43	26					
7	22	6.9	7.29	26	22	6.8	7.23	27					
8	21	7.5	6.69	27	21	7.4	6.63	28					
9	21	6.4	7.41	27	21	6.2	7.39	27					
10	21	6.4	7.41	28	21	6.4	7.40	28	20				
# ALIVE	11				8								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

\*\*\* See min. on 4/28/92

**Ampelisca abdita CHRONIC EXPOSURE SEDIMENT ASSAY**

STUDY # 7814 -13					SAMPLE ID: E-3-SED-SMP				DILUENT: Hampton Estuary		START DATE:		
DAY	REP A				REP B				REP C				INITIALS
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	
0	21	6.4	7.47	27	21	6.5	7.53	27	21	6.7	7.40	27	JS
1	22	6.4	7.55	27	22	6.3	7.57	29	22	6.5	7.57	29	UL
2	22	6.9	7.44	27	22	7.1	7.47	27	22	7.1	7.50	28	—
3	22	7.6	7.21	26	22	7.5	7.46	26	22	7.5	7.47	26	—
4	22	6.6	7.28	25	22	6.4	7.30	26	22	6.5	7.31	26	UL
5	22	6.9	7.26	30	22	6.9	7.25	30	22	6.9	7.29	30	XFB
6	22	7.0	7.56	28	22	7.0	7.56	28	22	7.1	7.57	27	—
7	22	6.7	7.27	30	22	6.7	7.46	28	22	7.0	7.46	27	—
8	21	7.5	7.25	28	21	7.4	7.23	29	21	7.4	7.19	28	CV
9	21	5.8	7.35	29	21	5.9	7.34	28	21	5.7	7.35	29	UL
10	21	5.9	7.33	29	21	6.1	7.31	29	21	6.1	7.38	29	CE
# ALIVE	16				19				11				JS

DAY	REP D				REP E				AMMONIA*				
	TEMP	D.O.	pH	SAL.	TEMP	D.O.	pH	SAL.	A	B	C	D	E
0	21	6.8	7.41	27	21	6.7	7.37	27	8	///	///	///	///
1	22	7.0	7.50	27	22	6.8	7.51	27					
2	22	7.1	7.57	28	22	7.1	7.50	28					
3	22	7.3	7.47	26	22	7.4	7.45	26					
4	22	6.5	7.24	26	22	6.5	7.23	25					
5	22	6.9	7.96	30	22	6.7	6.99	30	XFB				
6	22	6.9	7.56	27	22	6.9	7.48	28					
7	22	6.9	7.27	26	22	6.8	7.26	27					
8	21	7.4	6.79	28	21	7.3	7.15	30					
9	21	5.8	7.35	28	21	5.9	7.28	29					
10	21	6.1	7.57	28	21	6.0	7.29	29	CE				
# ALIVE	14				8								

\* - Ammonia values on Day 0 were measured on the porewater. Ammonia on Days 5 and 10 were measured on the overlying water.

\*\* see M.S. Doc. 4752

Appendices B-1, C,  
C-1, C-2, C-3, and C-4  
(pages 45-100)  
are available  
in a separate file (size: 4.3 MB)

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Appendices D and E-1  
(pages 101-157)  
are available  
in a separate file (size: 4.3 MB)

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Appendix E-1 Tables and Figures,  
and Appendix E-2  
(pages 158-220)  
are available  
in a separate file (size: 5.0 MB)

**[Click here to view.](#)**